Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (Currently Amended) A protection circuit for a radio frequency (RF) power amplifier, the RF power amplifier operable to receive an RF input signal and amplify the RF input signal, the protection circuit comprising:

shunt circuitry operable to shunt an RF input signal to AC ground, the shunt circuitry including,

a shunt switch operable to shunt the RF input signal to AC ground and release the RF input signal from AC ground, the shunt switch being controlled by control circuitry; and

the control circuitry including ramp circuitry, the ramp circuitry operable to control the shunt switch so that the shunt switch releases the RF input signal from AC ground for input to an RF amplifier, the control circuitry including a delay stage so that the shunt circuitry continues to shunt the RF input signal to AC ground until after the RF power amplifier has turned back on after a shutdown event.

2. (Original) The protection circuit of claim 1, wherein the shunt switch comprises a linear region MOSFET.

3. (Original) The protection circuit of claim 2, wherein the linear region MOSFET is an NMOS transistor.

4. (Original) The protection circuit of claim 1, wherein the ramp circuitry includes an RC network.

5. (Previously Amended) The protection circuit of claim 4, wherein the shunt switch releases the RF signal from AC ground exponentially.

6. (Original) The protection circuit of claim 4, wherein the ramp circuitry releases in accordance with a discharge of a capacitor in the RC network.

7. (Currently Amended) [The protection circuit of claim 1, further comprising] A protection circuit for a radio frequency (RF) power amplifier, the RF power amplifier operable to receive an RF input signal and amplify the RF input signal, the protection circuit comprising:

shunt circuitry operable to shunt an RF input signal to AC ground, the shunt circuitry including,

a shunt switch operable to shunt the RF input signal to AC ground and release the RF input signal from AC ground, the shunt switch being controlled by control circuitry; and

the control circuitry including ramp circuitry, the ramp circuitry operable to control the shunt switch so that the shunt switch releases the RF input signal from AC ground for input to an RF amplifier; and

bias shutdown circuitry operable to shut off a bias voltage or a bias current being supplied to an output transistor of the RF power amplifier;

peak detection circuitry operable to monitor an output voltage of the RF amplifier and provide a protection signal to the shunt circuitry and the bias shutdown circuitry when the output voltage of the RF amplifier exceeds a threshold voltage level, wherein the threshold voltage level is programmable through the peak detection circuitry.

8. (Cancelled)

9. (Cancelled)

10. (Previously Amended) The protection circuit of claim 1, wherein the control circuitry further includes delay circuitry operable to delay the ramp control circuitry from releasing the RF input signal from AC ground.

11. (Original) The protection circuit of claim 10, wherein the delay circuitry includes an RC network.

12. (Currently Amended) A protection circuit for a radio frequency (RF) power amplifier, the RF power amplifier operable to receive an RF input signal and amplify the RF input signal, the protection circuit comprising:

shunting means for shunting the RF input signal to AC ground and releasing the RF input signal from AC ground, the shunting means being controlled by control means; and

the control means for controlling the shunting means so that the shunting means releases the RF input signal from AC ground for input to an RF amplifier, the control means including a delay means so that the shunting means continues to shunt the RF input signal to AC ground until after the RF power amplifier has turned back on after a shutdown event.

13. (Original) The protection circuit of claim 12, wherein the shunting means comprises a linear region MOSFET.

14. (Original) The protection circuit of claim 13, wherein the linear region MOSFET is an NMOS transistor.

15. (Original) The protection circuit of claim 12, wherein the control means includes an RC network.

16. (Previously Amended) The protection circuit of claim 15, wherein the shunting means releases the RF signal from AC ground exponentially.

17. (Original) The protection circuit of claim 15, wherein the control means controls the shunting means to release the RF signal from AC ground in accordance with a discharge of a capacitor in the RC network.

18. (Currently Amended) [The protection circuit of claim 12, further comprising] A protection circuit for a radio frequency (RF) power amplifier, the RF power amplifier operable to receive an RF input signal and amplify the RF input signal, the protection circuit comprising:

shunting means for shunting the RF input signal to AC ground and releasing the RF input signal from AC ground, the shunting means being controlled by control means;

the control means for controlling the shunting means so that the shunting means releases the RF input signal from AC ground for input to an RF amplifier biasing;

biasing means for shutting off a bias voltage or a bias current being supplied to an output transistor of the RF power amplifier;

detecting means for monitoring an output voltage of the RF amplifier and providing a protection signal to the shunting means and the biasing means when the output voltage of the RF amplifier exceeds a threshold voltage level, wherein the threshold voltage level is programmable through the detecting means.

19. (Cancelled)

20. (Cancelled)

21. (Previously Amended) The protection circuit of claim 12, wherein the control means further includes delay means for delaying the shunting means from releasing the RF input signal from AC ground.

22. (Original) The protection circuit of claim 21, wherein the delay means includes an RC network.

23. (Currently Amended) An RF power amplifier, comprising:

amplifier circuitry operable to amplify an RF input signal and provide an amplified RF output signal;

peak detection circuitry operable to monitor the amplified output RF signal and detect when the amplified output signal exceeds a threshold voltage level, where the threshold voltage level is programmable through the peak detection circuitry; and

a bias network operable to provide a bias to the amplifier circuitry and shut off the bias to the amplifier circuitry when the peak detection circuitry detects that the amplified output signal has exceeded the threshold voltage level.

24. (Original) The RF power amplifier of claim 23, wherein the bias network is operable to further turn off an output transistor of the amplifier circuitry when the peak detection circuitry detects that the amplified output signal has exceeded the threshold voltage level.

25. (Original) The RF power amplifier of claim 23, further comprising shunt circuitry operable to shunt the RF input signal to AC ground when the peak detection circuitry detects that the amplified output signal has exceeded the threshold voltage level.

26. (Currently Amended) The RF power amplifier of claim 25, wherein the shunt circuitry comprises:

a shunt switch operable to shunt the RF input signal to AC ground and release the RF input signal from AC ground, the shunt switch being controlled by control circuitry; and

the control circuitry including ramp circuitry, the ramp circuitry operable to control the shunt switch so that the shunt switch releases the RF signal from AC ground for input to an RF amplifier, the control circuitry including a delay stage so that the shunt circuitry

continues to shunt the RF input signal to AC ground until after the RF power amplifier has turned back on after a shutdown event.

27. (Original) The RF power amplifier of claim 26, wherein the shunt switch comprises a linear region MOSFET.

28. (Original) The RF power amplifier of claim 27, wherein the linear region MOSFET is an NMOS transistor.

29. (Original) The RF power amplifier of claim 26, wherein the ramp circuitry includes an RC network.

30. (Currently Amended) The RF power amplifier of claim 26, wherein the [control circuitry further includes] delay stage [circuitry] is operable to delay the ramp control circuitry from releasing the RF input signal from AC ground.

31. (Currently Amended) A method for protecting an RF power amplifier from elevated output voltages, the method comprising:

programmably setting a threshold voltage level for peak detection;

detecting an output voltage of an RF power amplifier exceeding [a] the threshold voltage level;

shutting off bias to an output transistor of the RF power amplifier when the output voltage exceeds the threshold voltage level; and

turning off the output transistor of the RF power amplifier when the output voltage exceeds the threshold voltage level.

32. (Currently Amended) The method of claim 31, further comprising:

shunting an RF input signal to the RF power amplifier to AC ground when the output voltage exceeds the threshold voltage level; and

continuing to shunt the RF input signal to AC ground until after the RF power amplifier has turned back on after a shutdown event.

33. (Original) The method of claim 32, further comprising:

supplying bias to the output transistor and turning on the output transistor when the output voltage is reduced to a level below the threshold voltage level.

34. (Previously Amended) The method of claim 33, further comprising:

releasing the RF input signal from AC ground when the output voltage is reduced to a level below the threshold voltage level.

35. (Currently Amended) The method of claim 34, further comprising:

delaying the [gradual] release of the RF input signal from AC ground until a time after the output transistor has turned on.

36. (Previously Amended) The method of claim 32, further comprising providing an asymmetrical control that quickly shuts off the power amplifier and turns on the power amplifier at a gradual rate.

37. (Currently Amended) A protection circuit for an RF power amplifier, the protection circuit comprising:

means for detecting an output voltage of an RF power amplifier exceeding a threshold voltage level including means for programmably adjusting the threshold voltage level;

means for shutting off bias to an output transistor of the RF power amplifier when the output voltage exceeds the threshold voltage level; and

means for turning off the output transistor of the RF power amplifier when the output voltage exceeds the threshold voltage level.

38. (Currently Amended) The protection circuit of claim 37, further comprising:

means for shunting an RF input signal to the RF power amplifier to AC ground when the output voltage exceeds the threshold voltage level; and delay means so that the shunting means continues to shunt the RF input signal to AC ground until after the RF power amplifier has turned back on after a shutdown event.

39. (Original) The protection circuit of claim 38, further comprising:

means for supplying bias to the output transistor and means for turning on the output transistor.

40. (Previously Amended) The protection circuit of claim 39, further comprising:

means for releasing the RF input signal from AC ground when the output voltage is reduced to a level below the threshold voltage level.

41. (Currently Amended) The protection circuit of claim 40, further comprising:

means for delaying the [gradual] release of the RF input signal from AC ground until a time after the output transistor has turned on.

42. (Currently Amended) A wireless transceiver, comprising:

an RF power amplifier operable to amplify an RF input signal, the RF power amplifier including,

amplifier circuitry operable to amplify the RF input signal and provide an amplified RF output signal;

peak detection circuitry operable to monitor the amplified output RF signal and detect when the amplified output signal exceeds a threshold voltage level, the threshold voltage level being programmable through the peak detection circuitry; and

a bias network operable to provide a bias to the amplifier circuitry and shut off the bias to the amplifier circuitry when the peak detection circuitry detects that the amplified output signal has exceeded the threshold voltage level.

43. (Original) The wireless transceiver of claim 42, wherein the bias network is operable to further turn off an output transistor of the amplifier circuitry when the peak detection circuitry detects that the amplified output signal has exceeded the threshold voltage level.

44. (Currently amended) The wireless transceiver of claim 42, wherein the RF amplifier further comprises:

shunt circuitry operable to shunt the RF input signal to AC ground when the peak detection circuitry detects that the amplified output signal has exceeded the threshold voltage level; and

a delay stage so that the shunt circuitry continues to shunt the RF input signal to AC ground until after the RF power amplifier has turned back on after a shutdown event.

45. (Previously Amended) The wireless transceiver of claim 44, wherein the shunt circuitry comprises:

a shunt switch operable to shunt the RF input signal to AC ground and release the RF input signal from AC ground, the shunt switch being controlled by control circuitry; and

the control circuitry including ramp circuitry, the ramp circuitry operable to control the shunt switch so that the shunt switch releases the RF signal from AC ground for input to an RF amplifier.

46. (Original) The wireless transceiver of claim 45, wherein the shunt switch comprises a linear region MOSFET.

47. (Original) The wireless transceiver of claim 46, wherein the linear region MOSFET is an NMOS transistor.

48. (Original) The wireless transceiver of claim 45, wherein the ramp circuitry includes an RC network.

49. (Currently Amended) The wireless transceiver of claim 45, wherein the [control circuitry further includes] delay [circuitry] stage is operable to delay the ramp control circuitry from releasing the RF input signal from AC ground.

50. (Original) The wireless transceiver of claim 42, wherein the wireless transceiver is compliant with an IEEE standard selected from the group consisting of 802.11, 802.11a, 802.11b, 802.11e, 802.11g, 802.11h, and 802.11i, and 802.14.

51. (Currently Amended) An RF power amplifier, comprising:

amplifying means for amplifying an RF input signal and providing an amplified RF output signal;

detecting means for monitoring the amplified output RF signal and detecting when the amplified output signal exceeds a threshold voltage level, the detecting means including programmable means for setting the threshold voltage level; and

biasing means for providing a bias to the amplifying means and shutting off the bias to the amplifying means when the detecting means detects that the amplified output signal has exceeded the threshold voltage level.

52. (Original) The RF power amplifier of claim 51, wherein the biasing means is operable to further turn off an output transistor of the amplifying means when the detecting means detects that the amplified output signal has exceeded the threshold voltage level.

53. (Currently Amended) The RF power amplifier of claim 51, further comprising shunting means for shunting the RF input signal to AC ground when the detecting means detects that the amplified output signal has exceeded the threshold voltage level; and delaying means so that the shunting means continues to shunt the RF input signal to AC ground until after the RF power amplifier has turned back on after a shutdown event.

54. (Previously Amended) The RF power amplifier of claim 53, wherein the shunting means comprises:

switching means for shunting the RF input signal to AC ground and releasing the RF input signal from AC ground, the switching means being controlled by control circuitry; and

the control circuitry including ramping means for controlling the switching means so that the switching means releases the RF signal from AC ground for input to an RF amplifier.

55. (Original) The RF power amplifier of claim 54, wherein the switching means comprises a linear region MOSFET.

56. (Original) The RF power amplifier of claim 55, wherein the linear region MOSFET is an NMOS transistor.

57. (Original) The RF power amplifier of claim 54, wherein the ramping means includes an RC network.

58. (Currently Amended) The RF power amplifier of claim 54, wherein the [control circuitry further includes] delaying means is operable for delaying the ramping means from releasing the RF input signal from AC ground.

59. (Currently Amended) A wireless transceiver, comprising:

an RF power amplifier operable to amplify an RF input signal, the RF power amplifier including,

amplifying means for amplifying the RF input signal and provide an amplified RF output signal;

detecting means for monitoring the amplified output RF signal and detecting when the amplified output signal exceeds a threshold voltage level, the detecting means including programmable means for setting the threshold voltage level; and

biasing means for providing a bias to the amplifying means and shutting off the bias to the amplifying means when the detecting means detects that the amplified output signal has exceeded the threshold voltage level.

60. (Original) The wireless transceiver of claim 59, wherein the biasing means is operable to further turn off an output transistor of the amplifying means when the detecting means detects that the amplified output signal has exceeded the threshold voltage level.

61. (Currently Amended) The wireless transceiver of claim 59, wherein the RF amplifier further comprises

shunting means for shunting the RF input signal to AC ground when the detecting means detects that the amplified output signal has exceeded the threshold voltage level; and

delaying means so that the shunting means continues to shunt the RF input signal to AC ground until after the RF power amplifier has turned back on after a shutdown event.

62. (Previously Amended) The wireless transceiver of claim 61, wherein the shunting means comprises:

switching means for shunting the RF input signal to AC ground and releasing the RF input signal from AC ground, the switching means being controlled by control circuitry; and

the control circuitry including ramping means for controlling the switching means so that the switching means releases the RF signal from AC ground for input to an RF amplifier.

63. (Original) The wireless transceiver of claim 62, wherein the switching means comprises a linear region MOSFET.

64. (Original) The wireless transceiver of claim 63, wherein the linear region MOSFET is an NMOS transistor.

65. (Original) The wireless transceiver of claim 62, wherein the ramping means includes an RC network.

66. (Currently Amended) The wireless transceiver of claim 62, wherein the [control circuitry further includes] delaying means <u>is operable</u> for delaying the ramping means from releasing the RF input signal from AC ground.

67. (Original) The wireless transceiver of claim 59, wherein the wireless transceiver is compliant with an IEEE standard selected from the group consisting of 802.11, 802.11a, 802.11b, 802.11e, 802.11g, 802.11h, and 802.11i, and 802.14.

Amendments to the Drawings:

The attached replacement sheet of drawings includes changes to Figure 3 and replaces the original sheet including Figure 3.

In Figure 3, the resistor connecting the collector of transistor Q_2 and the power source V_{DD} has been labeled R2.

Attachments following last page of this Amendment:

Replacement Sheet (1 page)
Annotated Sheet Showing Change(s) (1 page)